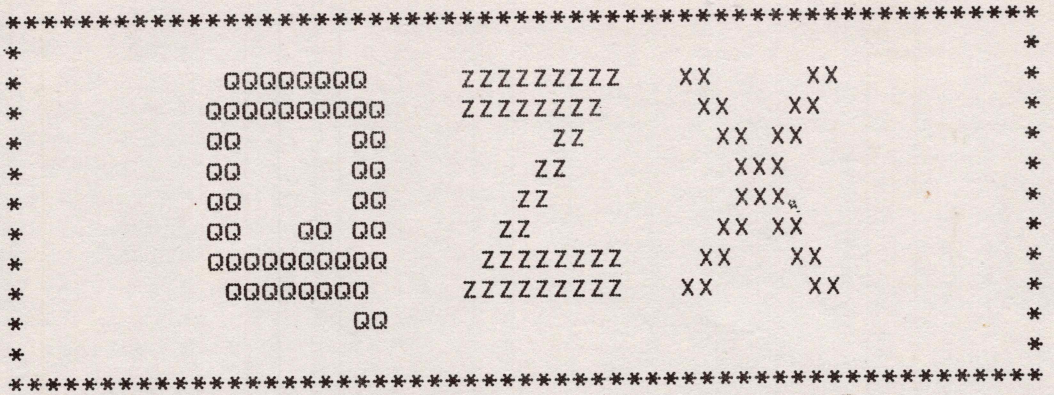
QQQQQQQ ZZZZZZZZZ XX XX
QQQQQQQQQ ZZZZZZZZ XX XX
QQ QQ ZZ XX XX
QQ QQ ZZ XXX
QQ QQ ZZ XXX
QQ QQ QQ ZZ XX XX
QQQQQQQQQ ZZZZZZZZ XX XX
QQQQQQQ ZZZZZZZZZ XX XX
QQ

The Journal Covering Amateur Radio & Sinclair Computers
ZX-80; Micro-Ace; ZX81; T/S 1000, 1500, & 2068; QL
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K5XY
Alex. F. Burr
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W4GHV
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Editor

Volume 5 Number 8 ($1.50-issue) July 1987

* A Battery-Backup Real Time Clock for the TS-1000, LU8MAD
* Collinear Antenna Design Program for the TS-1000, W2MS
* Editor's Doings, W4GHV

Editor's Doings
W4GHV

We heard from a volunteer willing to help in translating LU8MAD's works, in the event he wants to switch to 100% Spanish. If anyone is interested in the 128K memory addition to the QL, written in Spanish, let me know and I'll send it to our translator. With the cost of 512K kits almost reasonable, I've skipped the thought of adding the chips myself.

I get a kick out of Guillermo's unique mastery of our confusing English language. He does a much better job at English than I do with Spanish, despite 4 courses I've taken. He has promised us articles on Rotator-Control using the TS-1000 & RS-232 for CAT, "IF DISENTANGLEMENT CONCLUDE!" I dropped the ball a while back with the RS-232 article and could not get the second part of V.B. Rice's article, so I'm not much help to him. If anyone has programmed the 8251 USART with the TS-1000, I'm sure he would appreciate hearing from you.

The TS-440S and G5RV 'dipole' antenna continue to work well in my limited spare time. It was easily put in the top of some almost 100' high pine trees using one of the 'new-fangled' slingshots, a lead sinker, and some fishing line. Look for me 'chasing' (casually) DX on 20 CW and SSB.

I use the word 'dipole' loosely, since MY definition of one is one that presents a 50 ohm load at SOME ham frequency! The G5RV "works" fine on 80-10, with the automatic tuner in the TS-440S. It gets the SWR down low except on 30 meters where the minimum is 3:1. With the tuner out of the circuit, the SWR is too high for normal use on any of the bands. Someone said the TS-440S's tuner was only in line on transmit, and it has me wondering. Reception is fine and I don't know if having a perfect SWR is that meaningful on receive. I installed a lightning 'arrestor' and found that it is supposed to be used only with low SWRs. I left it in line and haven't had any lightning shutdowns due to the high coax SWR yet.

QSL's anyone? I recently had some super QSLs printed by W4MPY (Wayne Carroll, 705 Audubon Circle, Belvedere, SC, 29841). I got 1000 red, white, & blue cards along with a nice logbook for $51.00 (includes postage). I think his samples are free. You won't be disappointed with the cards! Find me on the bands and we'll swap QSO's & QSL's. I'll try to remember to set my rig to 7235 on Saturday mornings to see if the QZX Net we reported in the June issue really meets.

CLK/1000 - A Battery Backup Real Time Clock for the TS-1000
By Guillermo - LU8MAD

Here is another of Guillermo's ambitious projects. It is a clock calendar for your TS-1000 that has a battery backup, allowing the clock to remember the date & time after you have turned your computer off. Complete PC board layouts are included. Guillermo calls it a 'HYBRID' board since he had to do it single-sided and quite a few jumpers are required. The article appears elsewhere in this issue.

Collinear Antenna Program
By Tom Winternitz, W2MS

If you are interested in designing a collinear antenna, this program will prove useful. It appears elsewhere in this issue. One NOTE: Rin is the system input resistance assuming equal currents in the center of each element. If this is obtained by feeding each element with integral halfwave feeders (say) from a common point, then Rin would be divided by the number of elements.

EXAMPLE - THREE COLLINEAR HALFWAVE ELEMENTS
WITH .05 WAVELENGTH END TO END SEPARATION

```
3 ELEMENTS SPACED .05 END/END
Rin=92.03 : G/DIPOLE = 3.7DB

symmetrical
this half plane

to change nr. of elmts, goto 20
to change spacing only, goto 35
```

```
  2 GO SUB 6000
 20 CLS
 22 PRINT "NUMBER OF HALF WAVE ELEMENTS? - ";: INPUT E
 23 IF E<2 THEN  GO TO 22
 24 PRINT E
 25 LET L=.95/2
 35 CLS : PRINT "INPUT ELMT. END TO END SPACING"
 40 INPUT S: LET H=S+L
 41 CLS : PRINT E;" ELEMENTS SPACED ";S;" END/END"
 95 LET RI=73
100 FOR N=1 TO E
105 LET H=N*H: GO SUB 6200
110 LET RI=RI+RM
115 LET G=(SQR (N*73/(RI)))
120 NEXT N
123 LET H=S+L
130 PRINT " Rin=";INT (100*RI)/100;" : G/DIPOLE = ";INT (200*.4343*LN G)/10;"DB
"
134 GO SUB 5400
135 GO SUB 5500
140 PRINT AT 10,0;"symmetrical";AT 12,0;"this half plane": PRINT
145 PRINT AT 20,0;"to change nr. of elmts, goto 20"
146 PRINT AT 21,0;"to change spacing only, goto 35"
150 STOP
5400 REM PLOT AXIES
5405 FOR Y=25 TO 130: LET X=128: PLOT X,Y: NEXT Y
5410 FOR X=128 TO 250: LET Y=86: PLOT X,Y: NEXT X
5415 RETURN
5500 REM PLOT
5505 FOR I=0 TO PI/2 STEP PI/40: GO SUB 5510: NEXT I
5508 FOR I=1.5*PI TO 2*PI STEP PI/40: GO SUB 5510: NEXT I: RETURN
5565 IF SIN (PI*SIN I)=0 THEN  GO TO 5600
5566 LET P=ABS (SIN (E*PI*H*SIN I)/(E*SIN (PI*H*SIN I)))
5567 IF SIN (I+PI/2)=0 THEN  GO TO 5600
5568 LET PD=ABS (COS (PI/2*COS (I+PI/2))/SIN (I+PI/2))
5570 LET XP=P*PD*127*COS I
5575 LET YP=P*PD*85*SIN I
5590 LET X=XP+128: LET Y=YP+86
5593 PLOT X,Y
5600 RETURN
6000 DIM S(125): DIM C(125): DIM N(20)
6010 DATA .1996,.3965,.5881,.7721,.9461,1.1081,1.2562,1.3892,1.5058,1.6054,1.687
6,1.7525,1.8004,1.8321,1.8487,1.8514,1.8419,1.8220,1.7933,1.7582,1.7184,1.6758,
1.6325,1.5900,1.5499,1.5137,1.4823,1.4567,1.4374,1.4247,1.4187,1.4192,1.4258,1.
4379,1.4546,1.4751,1.4983,1.5233,1.5489
6020 DATA 1.5742,1.5981,1.6198,1.6386,1.6538,1.6650,1.6721,1.6747,1.6732,1.6676,
1.6584,1.6460,1.6311,1.6144,1.5965,1.5783,1.5604,1.5436,1.5284,1.5154,1.5050,1.
4976,1.4933,1.4922,1.4943,1.4994,1.5051,1.5172,1.5291,1.5423,1.5562,1.5704,1.58
41,1.5970,1.6085,1.6182,1.6258,1.6309,1.6336,1.6337
6030 DATA 1.6313,1.6266,1.6197,1.6111,1.6011,1.5901,1.5787,1.5671,1.5560,1.5457,
1.5366,1.5291,1.5234,1.5197,1.511,1.5186,1.5212,1.5257,1.5319,1.5395,1.5482,1.5
577,1.5674,1.5771,1.5864,1.5949,1.6023,1.6082,1.6126,1.6153,1.6161,1.6151,1.612
4,1.6081,1.6023,1.5955,1.5877,1.5795,1.5710,1.5626,1.5547,1.5476,1.5415,1.5367,
1.5333,1.5315
6035 DATA -2.4191,-1.7279,-1.3255,-1.0422,-.8247,-.6492,-.5031,-.3788,-.2715,-.1
778,-.0953,-.0223,.0427,.1005,.1522,.1983,.2394,.2761,.3086,.3374,.3374,.4105,.
4620,.4717,.4568,.4230,.3751,.3173,.2533,.1865,.1196,.0553,-.0045,-.0580,-.1038
,-.1410,-.1690,-.1877,-.1970,-.1976,-.1900,-.1753
```

```
6040 DATA -.1544,-.1287,-.0994,-.0681,-.0359,-.0042,.0258,.0531,.0767,.0960,.110
4,.1196,.1236,.1224,.1164,.1061,.0919,.0474,.0553,.0345,.0133,-.0077,-.0257,-.0
455,-.0609,-.0733,-.0824,-.0878,-.0896,-.0877,-.0824,-.0740,-.0630,-.0498,-.035
0,-.0194,-.0034,.0121,.0268,.0399,.0510,.0598,.0660,.0694,.0699,.0677,.0628,.05
55,.0463,.0354,.0234,.0108,-.0019,-.0142,-.0257
6045 DATA -.0358,-.0443,-.0509,-.0552,-.0573,-.0571,-.0546,-.0500,-.0435,-.0354,
-.0261,-.0160,-.0054,.0055,.0153,.0246,.0327,.0394,.0444,.0476,.0487,.0480,.045
3,.0409,.0349,.0277,.0195,.0107,.0016,-.0073,-.0159,-.0236,-.0303,-.0357,-.0395
,-.0417,-.0423,-.0411,-.0383,-.0341,-.0286,-.0220,-.0147,-.0068
6052 FOR X=1 TO 125: READ S(X): NEXT X
6054 FOR I=1 TO 20: READ N(I): NEXT I
6056 FOR I=5 TO 125: READ C(I): NEXT I
6058 RESTORE : RETURN
6060 REM ANS=SI(V)
6061 IF V<=.2 THEN  LET ANS=V: GO TO 6070
6062 IF V>25 THEN  LET ANS=PI/2-COS V/V: RETURN
6065 LET U=V/.2
6066 LET D=U-INT U: LET U=INT U
6067 LET DX=S(U+1)-S(U)
6068 LET ANS=S(U)+DX*D
6070 RETURN
6100 REM ANS=CI(C)
6101 IF C>=25 THEN  LET ANS=SIN C/C: RETURN
6102 IF C<=.05 THEN  LET ANS=.5772+LN C: GO TO 6119
6105 IF C>.05 AND C<=1 THEN  LET U=C/.05
6106 IF C>1 THEN  LET U=C/.2: GO TO 6116
6108 LET D=U-INT U: LET U=INT U
6109 LET DX=N(U+1)-N(U)
6110 LET ANS=N(U)+DX*D
6112 GO TO 6119
6116 LET D=U-INT U: LET U=INT U
6117 LET DX=C(U+1)-C(U)
6118 LET ANS=C(U)+DX*D
6119 RETURN
6200 REM RMUT-XMUT
6210 LET BL=2*PI*L: LET BH=2*PI*H
6218 LET V=2*BH: GO SUB 6060: LET SIBH=ANS
6220 LET C=2*BH: GO SUB 6100: LET CIBH=ANS
6222 LET C=2*(BH-BL): GO SUB 6100: LET CISP=ANS
6224 LET C=2*(BH+BL): GO SUB 6100: LET CISPF=ANS
6228 LET C=2*BL: GO SUB 6100: LET CIBL=ANS
6230 LET V=2*BL: GO SUB 6060: LET SIBL=ANS
6232 LET V=2*(BH-BL): GO SUB 6060: LET SISP=ANS
6234 LET V=2*(BH+BL): GO SUB 6060: LET SISPF=ANS
6236 LET RM=-15*COS BH*(-2*CIBH+CISP+CISPF-LN ((BH*BH-BL*BL)/(BH*BH)))+15*SIN BH
*(2*SIBH-SISP-SISPF)
6238 LET XM=-15*COS BH*(2*SIBH-SISP-SISPF)+15*SIN BH*(2*CIBH-CISP-CISPF-LN ((BH*
BH-BL*BL)/(BH*BH)))
6240 RETURN
6241 LET L=.5: LET H=.6: LET SP=H-L: GO SUB 6200
6242 PRINT H-L,INT (RM*100)/100;"  ";INT (XM*100)/100
6245 LET H=H+.1: GO SUB 6200: GO TO 6242
8999 STOP
9000 SAVE "COLINEAR" LINE 9001
9001 RUN
```

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REAL TIME CLOCK
LU8MAD

LIST 1

```
6 63 14 207 10 211 247 14 208
10 211 246 0 0 201 0 0 6 63 14
232 10 211 247 58 233 63 71 58
234 63 79 219 246 230 15 2 0 0
201 0 63 0 0 0 0 0 0 0 0 0 0 0
0 0 0
```

ENTER 1 REM leaving 56 spaces, and then enter the following temporary poking routine:

```
10 FOR A = 16514 TO 16569
20 IMPUT D
30 POKE A, D
40 SCROLL
50 PRINT A;" ";PEEK A
60 NEXT A
```

ENTER the above List 1
After the machine code is loaded lines 10 to 60 are deleted.
Next you should "DUMP" machine code into BBRAM (Battery backed-up RAM), (see RAMbo RESCUE in QZX September 1986), as part of main program type the following:

```
9000 LET B = 16320
9010 FOR A = 16514 TO 16569
9020 POKE B, PEEK A
9030 LET B = B + 1
9040 NEXT A
9050 RETURN
```

If RAM into 8-16K area is not available, then lines 9000 - 9050 are avoidable and in replacement of LIST 1 type the next list for machine code.

LIST 2

```
6 64 14 145 10 211 247 14 146
10 211 246 0 0 201 0 0 6 64 14
170 10 211 247 58 171 64 71 58
172 64 79 219 246 230 15 2 0
0 201 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0
```

You can use this machine code in 1 REM with BASIC programs of the NEIL BUNGARD article in RE August of 1984. LIST 2 replace the TABLE 6 of Bungard's article.

If you possess BBRAM type the following program:

```
 1 REM ( LIST 1)
 2 GOSUB 9000
 5 GOTO 300
10 FOR I = 0 TO 12
20 PRINT "IMPUT VALUE FOR REGISTER";
   I;" ";
30 IMPUT A
32 PRINT A
35 IF I = 5 THEN LET A = A + 8
40 POKE 16335, I
50 POKE 16336, A
60 LET C = USR 16320
70 NEXT I
90 GOTO 300
100 CLS
105 LET C = Ø
110 LET D = 235
120 FOR I = 0 TO 12
130 POKE 16360, C
140 POKE 16361, 63
150 POKE 16362, D
160 LET A = USR 16337
170 LET C = C + 1
180 LET D = D + 1
190 NEXT I
200 RETURN
300 CLS
310 PRINT AT 4,4;"1 INITIAL SETTING"
320 PRINT AT 8,4;"2 RETRIEVE TIME"
330 PRINT AT 12,4;"3 RETRIEVE DATE"
340 PRINT AT 14,4;"4 REAL TIME CLOCK"
345 IMPT T$
350 IF T$ ="1" THEN GOTO 8
360 IF T$ ="2" THEN GOTO 382
370 IF T$ ="3" THEN GOTO 386
372 IF T$ ="4" THEN GOTO 390
380 GOTO 340
382 GOSUB 100
384 GOSUB 400
386 GOSUB 100
388 GOTO 500
390 GOSUB 100
392 GOSUB 400
394 GOTO 390
```

```
400 CLS
410 DIM A(6)
420 LET X = 16363
430 FOR J = 1 TO 6
440 LET A(J)= PEEK X
450 LET X = X + 1
460 NEXT J
475 IF A(6)> 2 THEN LET A(6)= A(6)
    - 8
480 LET Z$ = STR$ A(6) + STR$ A(5)
    + ":" + STR$ A(4) + STR$ A(3)
    + ":" + STR$ A(2) + STR$ A(1)
490 PRINT AT 21,10; Z$
495 RETURN
510 DIM A(6)
520 LET X = 16370
530 FOR J = 1 TO 6
540 LET A(J) = PEEK X
550 LET X = X + 1
560 NEXT J
570 LET B = 19
580 PRINT A(4);A(3);"/";A(2);A(1);
    "/";B;A(6);A(5)
590 GOTO 300
```

MEMORY LOCATIONS OF REGISTER VAL.

16363	0	- SECONDS
16364	1	- TENS OF SECONDS
16365	2	- MINUTES
16366	3	- TENS OF MINUTES
16367	4	- HOURS
16368	5	- TENS OF HOURS
16369	6	- DAY OF WEEK
16370	7	- DAYS
16371	8	- TENS OF DAYS
16372	9	- MONTHS
16373	10	- TENS OF MONTHS
16374	11	- YEARS
16375	12	- TENS OF YEARS

After ejecution lines 10 to 70 of Basic program, all 13 register of the MSM 5832 will reside in memory in the address listed above. Once the date and time information reside in memory, it is a simple matter to retrieve it and display it for use in program for OSCAR tracks, etc.

You can write a small routine to retrieve time and date for specific use.

BIBLIOGRAPHY

-Fail-Safe, Real-Time Clock for TRS-80 by John C.MEIN, C&E, December 1983, pg 82

-Interfacing the ZX81, by Neil BUNGARD, RE, Part 1 & Part 2, July-August 1984

-FIELD DAY LOGGING & HARDWARE CLOCK, by Ed SONNANSTINE, W8NFQ, QZX July 1984

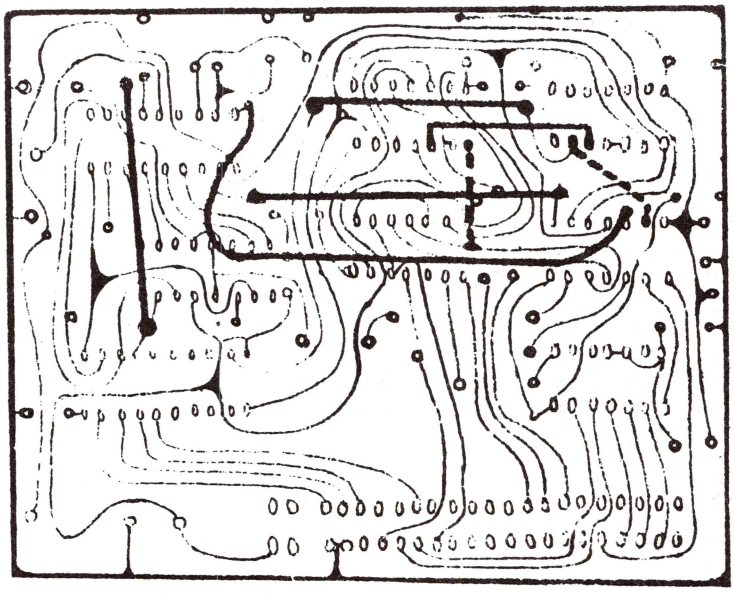
— • —

This real-time clock-calendar CLK/1000 is part of a more ambitious project in realization at present in LU8MAD shack: A computer-operated rotator-control interface, and computer aided transceiver for satellite tracks, contest, and so, with the TS1000 computer.

The complete system include the following

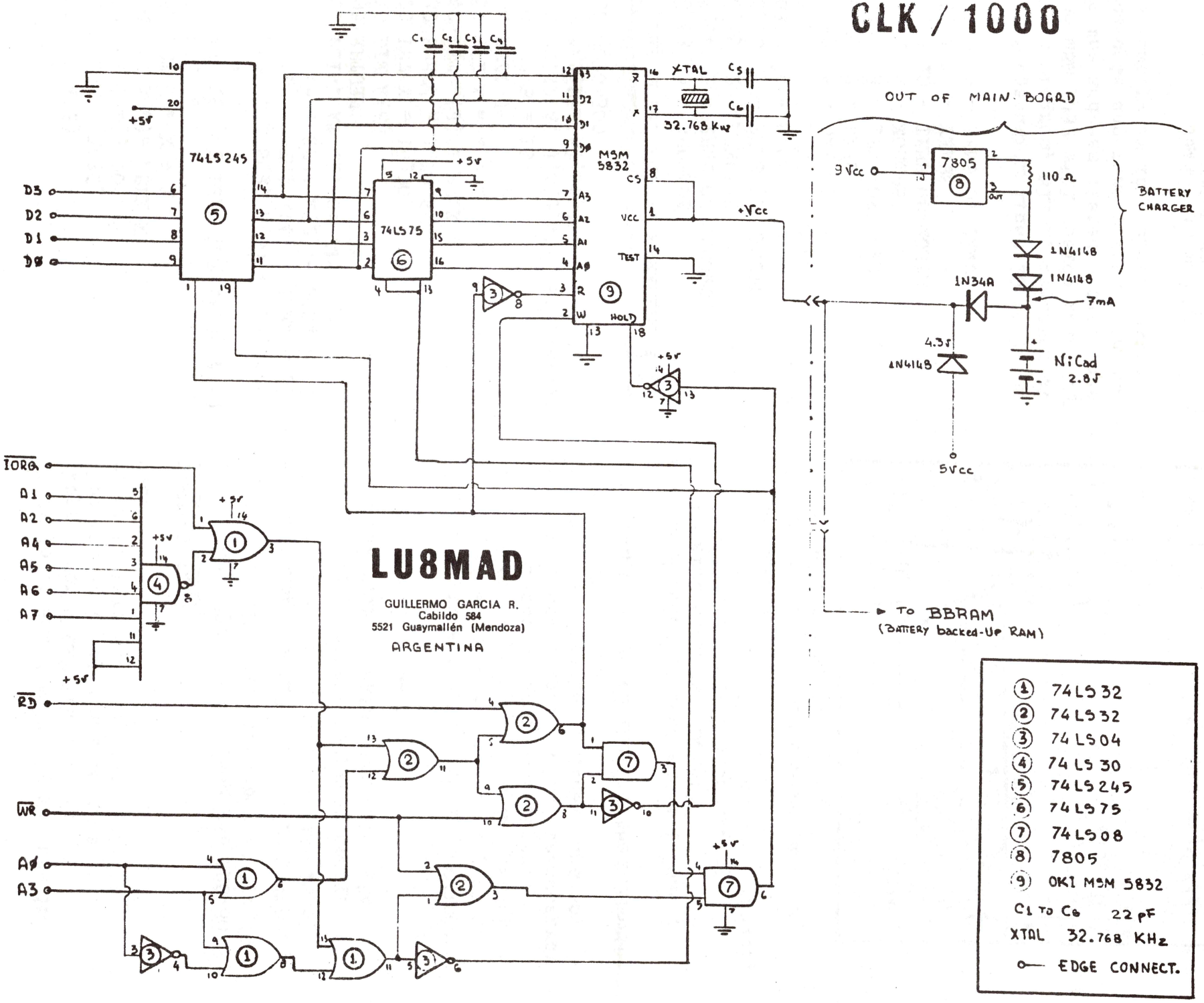
1 - CLK / 1000 Clock-Calendar (Done!)
2 - ROTATOR CONTROL (Done!)
3 - RS-232 Interface (in Debugging)
4 - RTTY & CW in only PC Board (in trouble shooting)

An article of Rotator control & RS 232C interface for CAT, is coming..!



JUMPERS OF ISOLATED WIRES ON COPPER SIDE OF PC

CLK / 1000

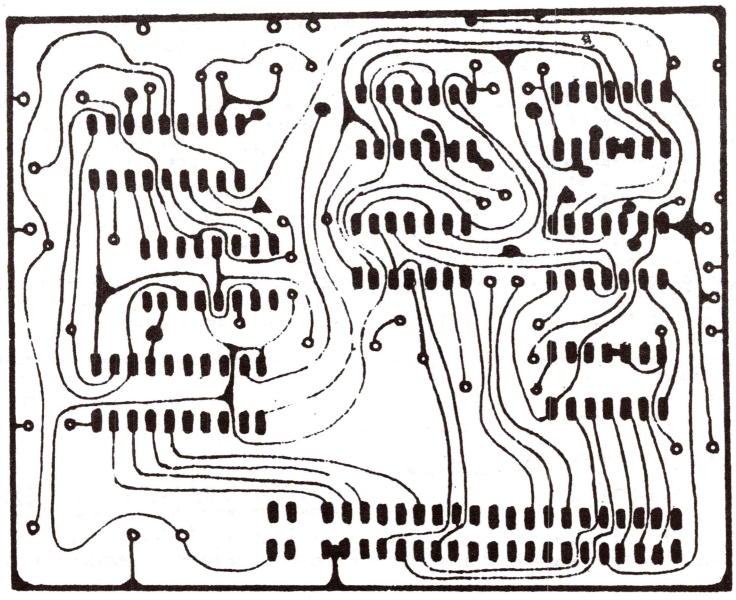


①	74LS32
②	74LS32
③	74LS04
④	74LS30
⑤	74LS245
⑥	74LS75
⑦	74LS08
⑧	7805
⑨	OKI MSM 5832

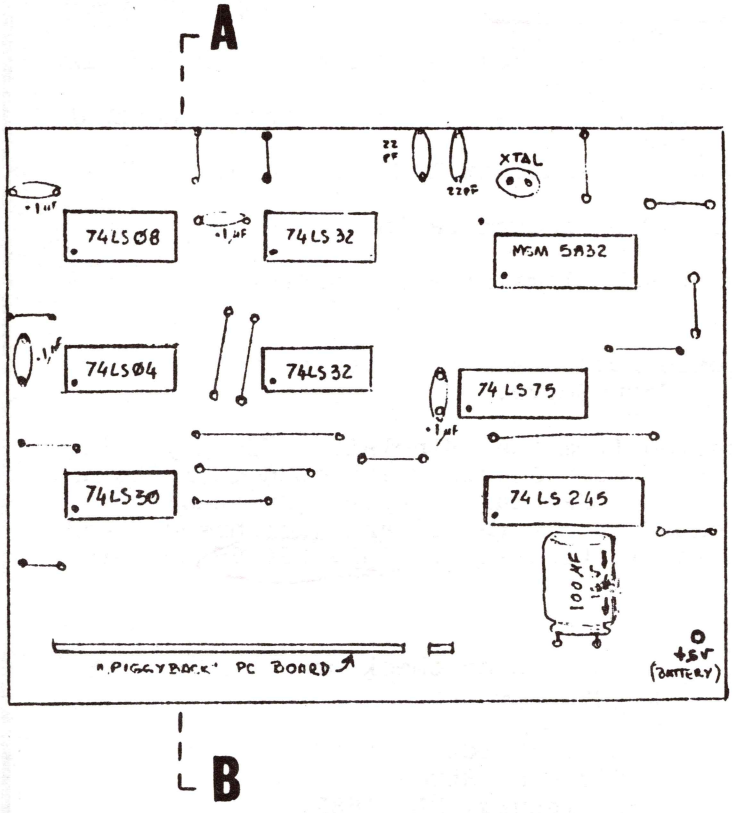
C1 to C6 22 pF

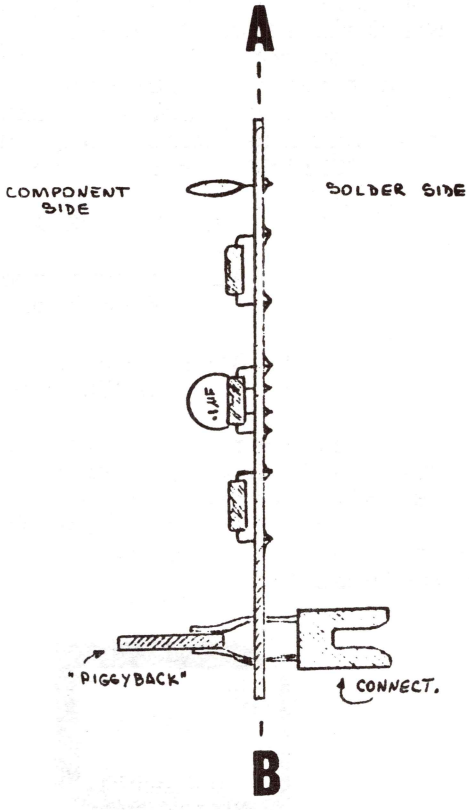
XTAL 32.768 KHz

o— EDGE CONNECT.



Foil PATTERN
FULL SIZED
SOLDER SIDE





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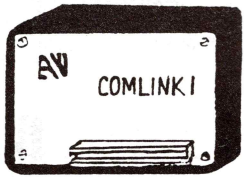

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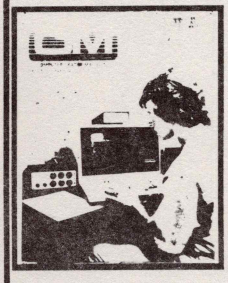

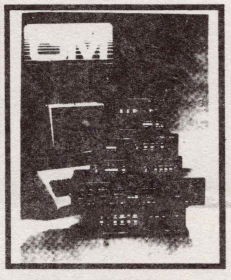

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